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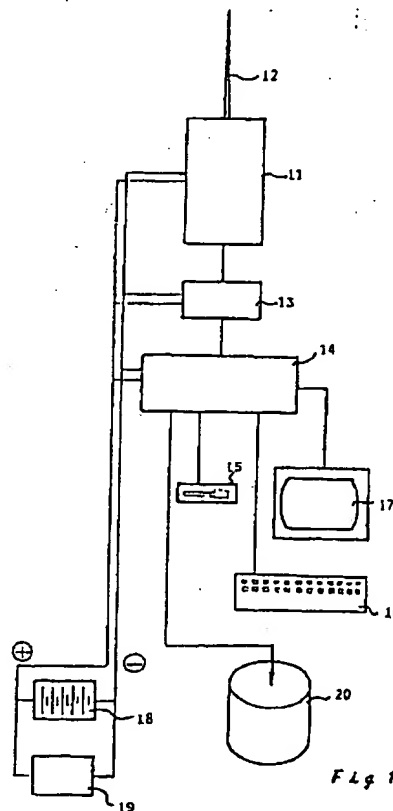
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(54) Car hire system.

(57) A highly automated car-rental system based on a specially equipped fleet of cars for hire and one or more control stations. An authorized subscriber can enter any car of the fleet which is free for hire at any location, and use it for a desired period of time, parking it at the end of the hire period at any authorized parking place. Cars are equipped with customer identification means, means enabling use of the car or refusing such use, monitoring means for the main subsystems and other parameters of the car and means for conveying such information to central control. There is also provided a system for monitoring in real time car position, and if desired, for displaying such information also on a monitor in the car, thus informing control on the position of the car at any instant of time.



EP 0 451 482 A1

as it obviates the cost and inconvenience of parking.

Each car will be equipped with a plurality of sensors adapted to inform the vehicle computer or central control about the main systems of the car, such as fuel level, oil, cooling water, tire pressure, electrical system, state of the battery, brakes and other systems.

Evaluation of the data by the computer of central control will indicate whether any servicing is required and whether it is safe to continue using the car or not. It will indicate whether servicing is required before renting the car to the next subscriber. The type and number of monitored parameters is a matter of choice of the operators of the system. The car computer and/or the central control will also control access to the luggage compartment, provide for opening and locking of the hood, opening and locking of car doors etc.

Central control has all the time a good overall picture about the distribution of cars free for hire over the network of the streets. If any undue accumulation occurs, cars can be moved by personnel to other parts of the city thus increasing the number of cars offered at such location, and to increase overall use of the car fleet.

According to a preferred embodiment, local authorities anxious to reduce the use of private cars and their parking in city streets, will allocate special parking places for cars of the system.

As pointed out above, each car will be equipped with a special computer and amongst its tasks: customer identification and authorization of car use, monitoring of car position at any given period of time (in cooperation with the car location system in city streets), monitoring status and performance of key car subsystems, and transmitting all such data to the main control station for evaluation and if required - action. Any type of commonly used cards can be used, such as magnetic cards, bar code cards, clever electronic cards, etc; the car being equipped accordingly with card-reading and decoding means. A transceiver is used for communication with central control. If desired, means can be provided for displaying any desired information for the person who rented the car. The car can also be provided with a computer graphic display.

Central control (or the memory device of the computer in any of the cars) will contain data on subscribers, also indicating disqualified ones.

The cars can be equipped with alarm means which will be actuated when an unauthorized person tries to use a car or when the car is stolen. The location indication system can be used for locating the position of a stolen car. If desired, means can be provided enabling the person renting the car to inform central control about any

emergency and thus to obtain speedy assistance.

Central control at offices of the company or other location, will comprise either a large computer or a network of inter-connected smaller ones, connected via a modem and transceiver with each car of the network, assigning to each car or group of cars a special frequency. As transmissions are only for a small percentage of time, computers and transceivers can be used for communication with a plurality of cars.

Nearly all of the components used in the system are conventional ones and need no detailed description. As stated above, the main feature is the semi-automatic car hire processes and return of vehicle after use by parking in any authorized parking zone. Pick-up of any free car will be wherever such a car is found parked, i.e. where the last user has terminated his car-hire.

The invention is illustrated with reference to the enclosed schematical drawings, which are not according to scale and in which:

Figure 1 is a block diagram of the mobile car position indicating system, part of the car for hire;

Figure 2 is a block diagram of a car status monitoring and control system incorporated in cars of the invention;

Figure 3 is a perspective view of a car equipped with a slot for inserting the actuation (magnetic) card of the user; and which bears also indication means for the status of the car at any given period of time;

Figure 4 illustrates the dashboard of such a car, computer keyboard and monitor screen;

Figure 5 is a plan view of part of a city indicating plan, as displayed on the screen of the monitor in the car, indicating car position.

Figure 6 is a perspective view of a car location determining system.

Various systems and subsystems of the present invention are illustrated with reference to the enclosed drawings, and it ought to be understood that these are of an illustrative nature only, and that many variations and changes in the components, functions and interconnections can be resorted to, without departing from the general scope of the semi-automatic car-hire system of the invention.

As shown in Figure 1, car position indicating means according to the invention comprise in combination a transceiver 11, provided with an antenna 12, connected via modem 13 to a computer, generally a digital computer 14 which is connected with floppy disk drive 15, with keyboard 16 for providing input to the computer 14, and with monitor 17 connected to the computer. The device is powered by car battery 18 or by power supply 19. The computer 14 is also connected with a memory

Claims

1. A semi-automatic car-rental system enabling a customer-subscriber to pick up and rent a car of the car fleet of the system and use it according to his requirements, comprising in combination:
 - a fleet of cars each of which is provided with means for enabling an entitled subscriber to enter and actuate a car picked up by the customer at a random location;
 - subscriber identification means enabling the subscriber to identify himself to central control or his computer, and check his entitlement to use the car;
 - a location identification system informing a control station about the instant location of the car;
 - central control means storing data about the location of each car, about entitled customers, means for receiving information about a desired rental and for entitlement verification and for transmitting to the individual car a command authorizing or not the intended hire, means for monitoring data about each such use until the customer parks such car at any location and indicate the end of this car-hire.
2. A system according to claim 1, where the location determination means comprise a plurality of car positioning transceivers positioned in the area of the operation of the system, informing central control about the movement of each car.
3. A system according to claim 1 or 2, where the cars are each equipped with means for indicating to central control important data on the state of vital subsystems of the car, fuel reserve, oil level, cooling fluid and the like.
4. A system according to any of claims 1 to 3, where means are provided at central control for the billing of each rental period.
5. A system according to any of claims 1 to 4, where the customer identification means comprise an electronic or magnetic card and a subsystem actuated by the customer according to his specific code.

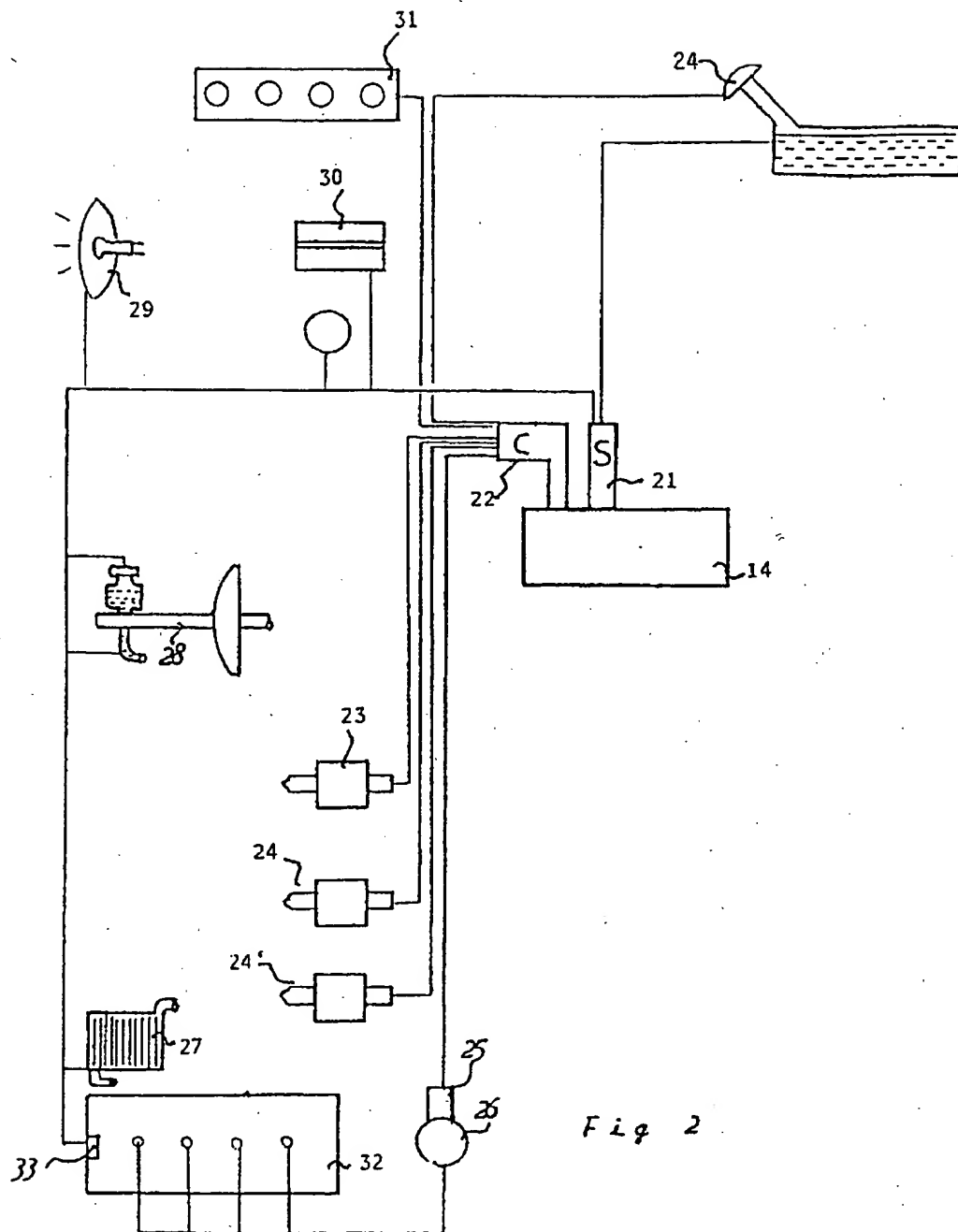


Fig 2

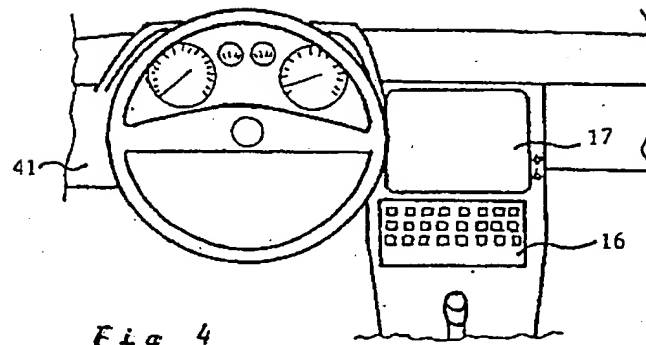


Fig 4

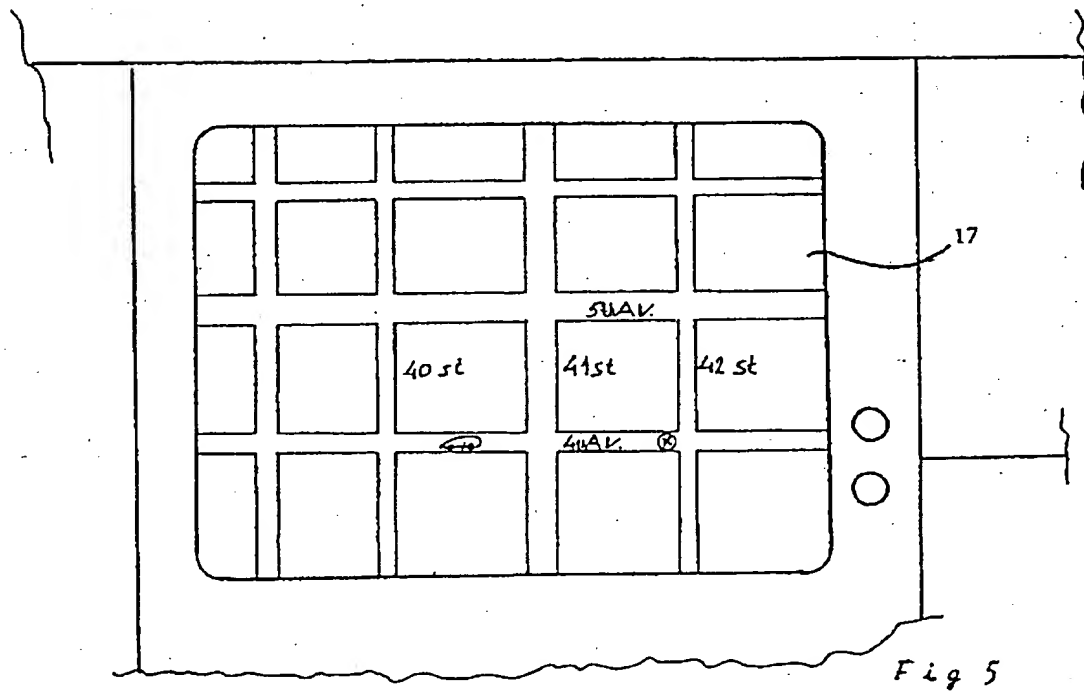


Fig 5



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EUROPEAN SEARCH REPORT

Application Number

EP 91 10 2927

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y,A	FR-A-2 535 491 (THOMSON-BRANDT) * page 6, line 22 - page 8, line 25; figures 1, 2 *	1,3-5	G 07 F 7/00 G 08 G 1/127 G 07 B 15/00
Y,A	US-A-3 757 290 (G.F. ROSS) * abstract; figures 1, 2 ** column 10, lines 31 - 64 *	1,2	
A	EP-A-0 179 160 (R. WUTTKE) * abstract; claims *	1,4,5	
A	EP-A-0 323 326 (SGS-THOMSON MICROELECTRONICS)		
A	DE-A-3 805 810 (V. AMEND)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			G 07 F G 07 C G 08 G
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		13 June 91	DAVID J.Y.H.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document			